UQ CAMOL NEWSLETTER

UNIVERSITY OF QUEENSLAND

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for the graphics editor.

Professor Jim McKeown from the University of Illinois visited recently
and adapted his PLATO Financial Accounting lessons for use on the
APPLE II. An extract from his report is included.

Laurie Barram describes a simple memory test for the APPLE II.

HELP WITH THE NEXT ISSUE

Dr Brian Carss has just completed a six week study of CAL developments
in the United States and the United Kingdom and attended the 3rd
World Conference on Computers in Education. He has promised an article
for the next issue of CAMOL. We would like to hear from some of
the other 26 Australians who attended the conference and doubtless
visited other institutions.

The response from our first CAMOL newsletter inviting additions to
our mailing list was somewhat overwhelming. It demonstrates a need
for a national newsletter for circulation to involved groups particularly
in tertiary institutions. However, our funds are limited and we
would like to see some return - namely contributions to the newsletter.
Please send them to:-

> Mark Williams
> Prentice Computer Centre
> University of Queensland
> ST LUCIA   4067

> Alan Coulter
> Director, Prentice Computer Centre

1.0 VISICALC

The Prentice Computer Centre has recently bought a "super-calculator" program for the APPLE II. It's name is VISICALC and it was developed by Software Arts, Inc.

The VISICALC program divides its memory space into a large two dimensional "work sheet". The screen displays a small window into this work sheet which can be moved about to display any desired portion. The "work sheet" can be thought of as you would a piece of paper, that is write numbers in some positions and later perhaps edit them out or replace them with others.

The following example may help to display some of the advantages of VISICALC. Suppose we wished to keep a table along the following lines:

	MALE	FEMALE	TOTAL
Horses	5	3	8
Sheep	4	6	10
Goats	1	2	3
	—	—	—
TOTAL	10	11	21

This is very easy to do on a piece of paper and is just as easy to do using VISICALC. (VISICALC even lets you label the rows and columns as done above). However, suppose one of our female sheep dies and we must adjust the table. On the piece of paper we have to scratch out four different numbers and reduce by one. VISICALC on the other hand can be set up so that by merely changing the 6 to a 5 all three totals are automatically changed.

This advantage is even more important when we consider that VISICALC lets you save the contents of its memory onto a named file on floppy disk (or cassette) at any time. So, of course, we can also restore old VISICALC sessions, update them and store them back.

VISICALC is extremely easy to learn thanks to a very friendly user interface and an excellent manual which teaches by working through some examples. Although VISICALC is programmable the user does not program it in the traditional sense. Therefore anyone who would have a need for it would be able to use it easily, not just programmers.

Brett Peterson
Prentice Computer Centre

2.0 NEW RELEASE FROM CONDUIT FOR APPLE II 48K

Dr Brian Carss has just returned from six weeks overseas looking at computer assisted learning developments in the United States and the United Kingdom.

He visited CONDUIT at the University of Iowa and has purchased copies of some of the programs described below. He attests to the high quality of these materials. Prospective C.A.L. authors may like to examine some of these units before considering buffing them.

It is anticipated that the University will enter into some group-buying arrangement with CONDUIT. Please contact Brian Carss on ext. 3185 for more information.

EVOLUT - Evolution and Natural Selection (#BIO082)

EVOLUT is the Pea Model programmed for the computer. Students can vary the type of selection (against one homozygote, both homozygotes, the heteroygotes), the degree of selection, and the size and composition of the initial population, and then follow the course of natural selection for as many generations as desired.

Ecological Modeling (#BIO083)

This package of eight programs introduces students to techniques for modeling ecological systems and processes. Students experientially test hypotheses and predict results from ecosystems by controlling initial population size, growth rate, time length of the simulation, and other parameters.

COEXIST - Population Dynamics (#BIO118)

COEXIST provides students with the facility to study population dynamics by simulating biological situations. By controlling the number of offspring, generation times, initial and saturation points, and inhibiting factors, students should learn about their influence on single-species populations and competition among species.

LINKOVER - Genetic Mapping (#BIO122)

This unit allows students to plan and execute a program of experiments to draw a genetic map of a single chromosome. The student specifies a series of genetic crosses and from the resulting data builds up a linkage map for ten genes of a hypothetical diploid species using the three-point testcross technique.

ENZKIN - Enzyme Kinetics (#BIO181)

This unit permits students to obtain realistic results rapidly using the computer program to simulate enzyme-catalyzed reactions. Six enzymes are simulated by the program for students to study.

COMPETE - Plant Competition (#BIO182)

This unit of seven investigations concerning interactions between flowering plants is designed around real experiments, simulated experiments, and second-hand data in the form of graphs and tables. The computer simulation allows students to plann and carry out investigations without the long delay usually associated with growth experiments.

RKINET - Reaction Kinetics (#CHM160)

This unit makes use of a computer program in which a mathematical model represents the ways in which various factors influence the rate of a chemical reaction. The model, based on data from real experiments, will broaden students' knowledge of first- and second-order reactions, rate constants, concentration, and the effect of temperature variation on reaction rate.

HABER - Ammonia Synthesis (#CHM199)

This computer simulation provides students with the opportunity to study the Haber process and how the various conditions (temperature, pressure, catalyst, and reactant concentration ratios) influence the course of the reaction (i.e., the time required to reach equilibrium yield of ammonia).

INTERP - Wave Superposition (#PHY183)

This unit on wave superposition is designed to improve students' understanding of the use of models in physics. The unit is built around the wave theory of light and shows students how effective the theory is in explaining observed phenomena.

SCATTER - Particle Scattering (#PHY129)

Because of the experimental difficulties in performing certain nuclear scattering investigations, models of three experimentl situations have been programmed for computer simulation. The programs give students experience in deducing the size, shape, and force law of a single sacttering center, and the scattering of alpha particles by a metal foil.

NEWTON - Satellite Orbits (#PHY130)

Using this program to simulate Newton's experiments, students are able to investigate Newton's Law of Gravitation and Second Law of Motion, and the relationship between these models.

Laboratory in Cognition and Perception (#PSY224)

This computer-based system provides a viable alternative to traditional laboratory courses by exposing students to a variety of phenomena, theoretical points of view, techniques, and experimental designs. Six experiments covering the human information processing system are included.

Tribbles (#BIO248)

This introductory unit on the scientific method consists of a written tutorial and a computer simulation. The tutorial presents students with a problem and guides them to its solution. The computer simulation provides the data for making observations and for forming tentative explanations and testing predictions. To eliminate the variable of background knowledge, the problem takes place on an alien planet inhabited by tribbles.

Brian Carss
Faculty of Education

3.0 LOWER CASE ON THE APPLE

Previously, while communicating with the PDP-10, it has only been possible to send and receive upper case characters on your Apple.

However, modifications to the communication software, found on the TOOLKIT diskette, now makes it possible to send and receive lower case as well.

To be able to generate lower case characters on your Apple, it is necessary to install a Paymar Lower Case Adaptor chip. The chip extends the Apples hardware character generator and thus there are no memory space or time overheads.

Copies of the new software are available at the Computer Centre at no charge (bring your own disk) and the adaptor chip is available at Computerland for approx. $50.00.

Brett Peterson
Prentice Computer Centre

4.0 GIGI TERMINAL

Digital Equipment Corporation are about to release a new terminal called GIGI (the General Image Generator and Interpreter). The GIGI is a typewriter-like keyboard enclosed in a lightweight plastic case. It connects to either a colour or black and white monitor, and the optional Digital LA34VA graphics printer. It may be connected via a 20MA current loop or EIA communications line to a host computer.

The major features of the GIGI are that it may operate as a 'text terminal', a 'graphics terminal' or a 'Basic terminal'.

As a text terminal it is most like a VT100. Most terminal characteritics are adjusted via local software in the GIGI for such things as line speed, parity etc. These attributes may be changed under the control of the host computer. The GIGI also features a programmable function numeric key pad. Keyboard layout is nearly standard, but the 'shift-lock' and 'control' positions are reversed (to most common terminals e.g. Visual 200) which may slow down the two finger speedsters.

As a graphics terminal I would have to rate it very highly indeed (but be warned, full evaluation is NOT complete).

The graphics are best described as fast, crisp, good resolution (about 750 x 500) and easy to control. The graphics are generated by character strings initiated by an escape sequence to turn on the local graphics interpreter. Commands are available to draw circles, boxes, lines, curves, arcs, text (variable size, width etc.), select colours, shades, patterns and so on. These commands may come from the host computer using the Regis (Remote Graphics Instructions Set) or from a local Basic program. The pictures may be stored on the host computer as a character file and 'loaded' at will. A 'locator' mode in the graphics helps to report the precise position of any point on the screen.

All software to drive the GIGI Graphics is located on the VAX, but we are told that Tops-10 software should soon be available. The major software in the VAX for the GIGI is the Graphics Editor (there is also a text editor for those inclined). The Graphics Editor is a most important piece of software because it allows the user to construct pictures under the control of the programed numeric key pad. Hence, one can draw diagrams etc. and save them very quickly and easily. They are changeable even after saving to a disc file. We have been able to create pictures on the VAX, save them, transfer them to the PDP-10 and load them back to the GIGI from the PDP-10. Some of the nice features of the Graphics Editor are:

(a)   ability to draw a circle, colour it in, enlarge it, shift it, reduce it, or take an arc of the circle.

(b)   curves are easily created by marking three or more points. The curve is automatically drawn.

(c)   easy to change background colour.

(d)   inclusion of text strings as manipulatable objects on the screen. The text may be located where suitable, easy to move again, change the size if desired and slope and angle of the text. Special character sets may also be generated.

The Graphics Editor does require practice and may produce some surprising results for the uninitiated (shading particularly!).

GIGI local Basic. Local basic may be entered via the keyboard or loaded from the host computer (we have a few wrinkles in this at the moment, but nothing serious). There is about 10K for programs. The speed of the interpreter is slow (one bench mark test showed it to be about half the speed of an Apple II 48K). There is no provision for local storage so all programs have to be saved on the host computer (simple command). The GIGI local basic includes statements such as if...then...else, LINPUT (whole line read). I have not put the local basic to a lot of use at this point, so perhaps a report at another time!

Pricing. DEC offer a "package" of five GIGI terminals, host software for about $2,200 per terminal plus cost of host software. These figures are not official. I believe DEC are prepared to negotiate prices, but interested persons should direct all enquiries to their local DEC representative. Host software is claimed to be available for Tops-20 and some PDP-11 systems. Remember we have used the GIGI on a host with no host software and achieved highly satisfactory results.

Geoff Vandenberg
Prentice Computer Centre

5.0 APPLES IN COMMERCE

Recently, the Commerce Department at the University of Queensland had the privilege of being host to Professor J. McKeown from University of Illinois. Professor McKeown implemented a C.A.L. set of lessons on an Apple II at the Prentice Computer Centre.

The normal language for the lessons on Illinois PLATO is Tutor which runs on a C.D.C. machine. This was truely a "shoe horn" effort to get it into the Apple. The following is an extract from Professor McKeown's Report to the Commerce Department on completeion of the task.

There is a lesson here for CAL-CAI developers.

"During my time on campus, I had to spend almost the first two weeks attempting to determine what would be the most appropriate hardware and language to use. Once this decision had been made, the actual conversion work has progressed at an increasing rate. Further conversion work would be much easier and I could do more effective preparation work at home (I had originally hoped to work in FORTRAN and had devised precedures which would have made implementation of

lessons in FORTRAN straight forward if the equipment had handled FORTRAN well. It turned out that this time was essentially wasted).

I received excellent co-operation from the people at the Prentice Computer Centre. In particular Geoff Vandenberg was very generous with his time and very knowledgeable about the equipment. (A problem which did arise is that Geoff is apparently viewed as the primary APPLE consultant on campus so he was constantly being interrupted and required to divert his attentions). In addition the Computer Centre was able to acquire the needed modifications to the hardware very promptly as well as making the administrative arrangements to enable me to get to work immediately and with a minimum of wasted effort and time.

Problems encountered included primarily the limitations of the APPLE as an instructional microcomputer. The disadvantages as far as the materials that I was working on were:

1. The lack of an adequate editor on the APPLE.

2. The lack of size to fit lessons in.

3. The lack of reliability of disk operations from BASIC.

4. The lack of ability to intermix lines and text on the 80 character display.

5. The lack of speed in processing which means that if the APPLE were to be used, some lessons would have to be substantially reduced in scope in order to be usable by students.

6. The lower case characters (and in general the entire 80 character display) are not legible enough for general student use (although they were satisfactory for my use).

Limitations in the converted lessons as compared to the originals:

1. The students cannot enter arithmetic expressions as responses to numeric questions. (In the original a student could enter an arithmetic expression as a response to a question and the computer would automatically evaluate the expression and compare the result to the desired answer).

2. The lack of capability to draw lines causing both less understandable worksheets and other forms and, more critically, a difficulty in indicating totalling operations in financial statements.

3. The lack of special keys to allow easy student-selected branching. (Most of the branching is still available but the operation of the branching is much more difficult for the

student).

4. At least at present the student will have to enter account numbers rather than account name. While this is not much more difficult for the student, it is considerably less desirable pedagogically since students will tend to fixate on numbers rather than names.

My limited prediction for computer assisted instruction on this campus would involve a decision as to whether the implementation will be on a stand-alone basis using microcomputers or a distributed basis using one dedicated central processor which would provide communications and downloaded lessons to a network of microcomputers. It seems like the latter is preferable if resources allow, but resources will be a continuing problem.

I am not a hardware expert and therefore cannot provide expert guidance as to the particular microcomputer which should be selected as the primary delivery system for the accounting materials. However, I do feel that any machine selected should have the following characteristics:

1. Ability to draw straight lines intermixed with text.

2. Selective positioning on the screen.

3. Selective erase abilities preferably including ability to erase only particular lines as opposed to entire character positions.

4. Minimum 24 lines of text. If only 24 lines at least 80 characters per line although some trade-off between character and lines can be made. For example, 64 characters would be acceptable if 32 lines were available.

5. Upper and lower case is highly desirable.

Other useful features would be some provision for special branching keys and a 10 key numeric entry facility."

James C. McKeown
Weldon Powell Professor
University of Illinois

Prentice Computer Centre

6.0 APPLE MEMORY TEST

A simple memory test has been written for the APPLE II. The program resides in a modified version of the APPLE monitor and this was programmed into a 2716 EPROM. To make room for the memory test, the LIST command was removed.

To use this monitor it is necessary to have a Language Card installed, as this is the easiest way to use a 2716.

The text uses the following command format:

        {START}.{END}T

If any errors are encountered, the error information is printed on the screen. The end of a successful pass is indicated by typing a "D" for done. It is not advisable to test memory below address 800 as the monitor uses this area.

The Computer Centre will program an EPROM for $25 if the user supplies the EPROM. The EPROM must be an INTEL 2716 or equivalent, the TMS 2716 is not compatable.

Laurie Barram
Prentice Computer Centre

7.0 THE 3RD WORLD CONFERENCE ON COMPUTERS IN EDUCATION

The conference was held in Lausanne, Switzerland from 27-31 July 1981 and attracted more than 1300 delegates from 61 different countries. Australia was strongly represented by a contingent of 26 people from universities, C.A.E.s and State Education departments.

Some of the topics that were discussed included C.A.L. Systems, Computer Literacy, Informatics and mathematics, Item banking and Education for the Industrial applications of computers.

It was very obvious from the variety of topics presented for discussion by delegates that there has been an increase in interest in C.A.L. and also, that a great deal of effort has been directed towards computers in education since the last World Conference, held four years ago in Marseilles.

A fuller report of the conference will be given in the next newsletter.

Brian Carss
Faculty of Education

8.0 CHANGE OF STAFF

Geoff Vandenberg has resigned and we wish him success in his new
enterprise.   Mark Williams will take his place and continue to be
assisted by Brett Peterson.

Alan Coulter
Prentice Computer Centre

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